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10/565,902	01/25/2006	Akira Suzuki	Q92405	7356

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EXAMINER	
SANTIAGO, MARICELI	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,902	SUZUKI ET AL.	
	Examiner	Art Unit	
	Mariceli Santiago	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/25/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Receipt of the Amendment, filed on January 25, 2006, is acknowledged.

Claims 1-12 are pending in the instant application.

Claim Objections

Claims 4-7 are objected to because of the following reasons:

Claims 4-7 recite "a seat tip having a thermal expansion coefficient **between that of the noble metal tip and that of itself [the seat tip] between the noble metal tip and itself [the seat tip]**". The recitation is unclear since it seems to be defining the thermal expansion coefficient of the seat tip in a range between that of the noble metal tip and that of itself, i.e., how can the seat tip have two thermal expansion coefficients. Appropriate correction is required. For examination purposes, the thermal expansion coefficient will be considered as that between the electrode and the noble metal tip, in view of applicant's specification, Page 38, lines 11-13.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima (JP 07-022155 A) in view of Osamura (US 6,215,235).

Regarding claim 1, Oshima discloses a method for producing a spark plug including a center electrode (3), an insulator (2) having an axial hole in an axial direction for holding the

center electrode on a front end side of the axial hole, a metal shell (6) for holding the insulator while surrounding the circumference of the insulator, and a ground electrode (7) having one end portion joined to the metal shell, and the other end portion to which a columnar noble metal tip facing the center electrode is welded, the method comprising the steps of resistance-welding (Fig. 5) a bottom surface of a noble metal tip (12) to thereby form a flange portion (14) having a swollen outer diameter of the noble metal tip in a bottom portion of the noble metal tip, and welding (17, Fig. 6) the noble metal tip to the electrode in such a manner that a laser beam is applied on the whole circumference of the flange portion (14) of the noble metal tip. Although, Oshima exemplifies the above welding processes for the manufacture of the noble metal tip on the center electrode, it is considered within the teachings of Oshima to use the same processes and welding techniques for welding a noble tip on the ground electrode with similar same expectations of success.

Oshima is silent in regards to the limitation of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the ground electrode from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60% or higher.

However, in the same field of endeavor, Osamura discloses a method for producing a spark plug by adjusting the noble metal content within the junction layer between the electrode and the noble metal tip, wherein content of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the ground electrode from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60 % or higher (Column 13, lines 19-52), in order to suppress internal thermal stress and prevent peeling or cracking of the junction between electrode and noble tip. Thus, it would have been obvious at the time the invention was made to a person

having ordinary skills in the art to incorporate the noble metal content in the junction layer disclosed by Osamura in the method of Oshima in order to suppress internal thermal stress within the junction layer and prevent peeling or cracking of the junction between electrode and noble tip.

Regarding claim 2, Oshima discloses a method for producing a spark plug including a center electrode (3) having a front end portion to which a columnar noble metal tip (12) is welded, an insulator (2) having an axial hole in an axial direction for holding the center electrode on a front end side of the axial hole, a metal shell (6) for holding the insulator while surrounding the circumference of the insulator, and a ground electrode (7) having one end portion joined to the metal shell, and the other end portion facing the center electrode, the method comprising the steps of resistance-welding (Fig. 5) a bottom surface of the noble metal tip (12) on a side opposite to a counter surface of the noble metal tip facing the ground electrode to the front end portion of the center electrode to thereby form a flange (14) portion having a swollen outer diameter of the noble metal tip in a bottom portion of the noble metal tip, and welding (17. Fig. 5) the noble metal tip (12) to the center electrode (3) in such a manner that a laser beam is applied on the whole circumference of the flange portion of the noble metal tip (Fig. 5).

Oshima is silent in regards to the limitation of the noble metal content in a position far by about 0.05 mm inward a molten portion between the front end portion of the center electrode and the noble metal tip from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60 % or higher.

However, in the same field of endeavor, Osamura discloses a method for producing a spark plug by adjusting the noble metal content within the junction layer between the electrode and the noble metal tip, wherein content of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the

center electrode from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60 % or higher (Column 13, lines 19-52), in order to suppress internal thermal stress and prevent peeling or cracking of the junction between electrode and noble tip. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the noble metal content in the junction layer disclosed by Osamura in the method of Oshima in order to suppress internal thermal stress within the junction layer and prevent peeling or cracking of the junction between electrode and noble tip.

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima (JP 07-022155 A) in view of Osamura (US 6,215,235), and further in view of Kondo et al. (US 4,540,910).

Regarding claim 4, Oshima discloses a method for producing a spark plug including a center electrode (3), an insulator (2) having an axial hole in an axial direction for holding the center electrode on a front end side of the axial hole, a metal shell (6) for holding the insulator while surrounding the circumference of the insulator, and a ground electrode (7) having one end portion joined to the metal shell, and the other end portion to which a columnar noble metal tip facing the center electrode the method comprising the steps of resistance-welding (Fig. 5) a bottom surface of a noble metal tip (12) to thereby form a flange portion (14) having a swollen outer diameter of the noble metal tip in a bottom portion of the noble metal tip, and welding (17, Fig. 6) the noble metal tip to the electrode in such a manner that a laser beam is applied on the whole circumference of the flange portion (14) of the noble metal tip. Although, Oshima exemplifies the above welding processes for the manufacture of the noble metal tip on the center electrode, it is considered within the teachings of Oshima to use the same processes and

welding techniques for welding a noble tip on the ground electrode with similar expectations of success.

Oshima is silent in regards to the limitation of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the ground electrode from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60% or higher.

However, in the same field of endeavor, Osamura discloses a method for producing a spark plug by adjusting the noble metal content within the junction layer between the electrode and the noble metal tip, wherein content of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the ground electrode from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60 % or higher (Column 13, lines 19-52), in order to suppress internal thermal stress and prevent peeling or cracking of the junction between electrode and noble tip. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the noble metal content in the junction layer disclosed by Osamura in the method of Oshima in order to suppress internal thermal stress within the junction layer and prevent peeling or cracking of the junction between electrode and noble tip.

The combined references to Oshima in view of Osamura fail to exemplify the limitation of providing a seat tip joined to the front end portion of the ground electrode and having a thermal expansion coefficient between that of the noble metal tip and that the electrode.

In the same field of endeavor, Kondo discloses a method for producing a spark plug further comprising a seat tip joined to the front end portion of the center electrode (Column 3, lines 50-59) and having a thermal expansion coefficient between that of the noble metal tip and

that the electrode (Column 6, lines 28-50), the seat tip acts as a stress relieving layer to adjust the thermal expansion coefficient between the noble metal tip and the electrode main body in order to prevent cracking and peeling off of the noble meal tip. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the seat tip disclosed by Kondo in the method of Oshima in view of Osamura in order to provide a stress relieving layer which adjust the thermal expansion coefficient between the noble metal tip and the electrode main body to prevent cracking and peeling off of the noble meal tip.

Regarding claim 5, Oshima discloses a method for producing a spark plug including a center electrode (3) having a front end portion to which a columnar noble metal tip (12), an insulator (2) having an axial hole in an axial direction for holding the center electrode on a front end side of the axial hole, a metal shell (6) for holding the insulator while surrounding the circumference of the insulator, and a ground electrode (7) having one end portion joined to the metal shell, and the other end portion facing the center electrode, the method comprising the steps of resistance-welding (Fig. 5) a bottom surface of the noble metal tip (12) on a side opposite to a counter surface of the noble metal tip facing the ground electrode to the front end portion of the center electrode to thereby form a flange portion (14) having a swollen outer diameter of the noble metal tip in a bottom portion of the noble metal tip, and welding (17, Fig. 5) the noble metal tip to the center electrode welding in such a manner that a laser beam is applied on the whole circumference of the flange portion of the noble metal tip.

Oshima is silent in regards to the limitation of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the ground electrode from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60% or higher.

However, in the same field of endeavor, Osamura discloses a method for producing a spark plug by adjusting the noble metal content within the junction layer between the electrode and the noble metal tip, wherein content of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the ground electrode from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60 % or higher (Column 13, lines 19-52), in order to suppress internal thermal stress and prevent peeling or cracking of the junction between electrode and noble tip. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the noble metal content in the junction layer disclosed by Osamura in the method of Oshima in order to suppress internal thermal stress within the junction layer and prevent peeling or cracking of the junction between electrode and noble tip.

The combined references to Oshima in view of Osamura fail to exemplify the limitation of providing a seat tip joined to the front end portion of the center electrode and having a thermal expansion coefficient between that of the noble metal tip and that the electrode. In the same field of endeavor, Kondo discloses a method for producing a spark plug further comprising a seat tip joined to the front end portion of the center electrode (Column 3, lines 50-59) and having a thermal expansion coefficient between that of the noble metal tip and that the electrode (Column 6, lines 28-50), the seat tip acts as a stress relieving layer to adjust the thermal expansion coefficient between the noble metal tip and the electrode main body in order to prevent cracking and peeling off of the noble meal tip. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the seat tip disclosed by Kondo in the method of Oshima in view of Osamura in order to provide a stress

relieving layer which adjust the thermal expansion coefficient between the noble metal tip and the electrode main body to prevent cracking and peeling off of the noble meal tip.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima (JP 07-022155 A) in view of Osamura (US 6,215,235), and further in view of Katoh et al. (US 5,465,022).

Regarding claim 6, Oshima discloses a method for producing a spark plug including a center electrode (3), an insulator (2) having an axial hole in an axial direction for holding the center electrode on a front end side of the axial hole, a metal shell (6) for holding the insulator while surrounding the circumference of the insulator, and a ground electrode (7) having one end portion joined to the metal shell, and the other end portion to which a columnar noble metal tip facing the center electrode the method comprising the steps of resistance-welding (Fig. 5) a bottom surface of a noble metal tip (12) to thereby form a flange portion (14) having a swollen outer diameter of the noble metal tip in a bottom portion of the noble metal tip, and welding (17, Fig. 6) the noble metal tip to the electrode in such a manner that a laser beam is applied on the whole circumference of the flange portion (14) of the noble metal tip. Although, Oshima exemplifies the above welding processes for the manufacture of the noble metal tip on the center electrode, it is considered within the teachings of Oshima to use the same processes and welding techniques for welding a noble tip on the ground electrode with similar expectations of success.

Oshima is silent in regards to the limitation of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the ground electrode from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60% or higher.

However, in the same field of endeavor, Osamura discloses a method for producing a spark plug by adjusting the noble metal content within the junction layer between the electrode and the noble metal tip, wherein content of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the ground electrode from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60 % or higher (Column 13, lines 19-52), in order to suppress internal thermal stress and prevent peeling or cracking of the junction between electrode and noble tip. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the noble metal content in the junction layer disclosed by Osamura in the method of Oshima in order to suppress internal thermal stress within the junction layer and prevent peeling or cracking of the junction between electrode and noble tip.

The combined references to Oshima in view of Osamura fail to exemplify the limitation of providing a seat tip joined to a bottom surface of the noble metal tip on a side opposite to a counter surface of the noble metal tip to an inner surface of the other end portion of the ground electrode on a side opposite to the center electrode, and having a thermal expansion coefficient between that of the noble metal tip and that the electrode.

However, in the same field of endeavor, Katoh discloses a method for producing a spark plug provided with a pre-formed composite noble metal tip (Fig. 9) comprising a noble metal tip (11C) and a seat tip (19C) joined to bottom surface of the noble metal tip, the seat tip acts as a stress relieving layer having a thermal expansion coefficient between that of the noble metal tip and that the electrode in order to reduce the thermal stress between the metal chip and the electrode main body (Column 21, lines 1-41). Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the seat tip layer

disclosed by Katoh in the method of Oshima in view of Osamura in order to provide a thermal stress relieving layer to reduce the thermal stress between the metal chip and the electrode main body.

Regarding claim 7, Oshima discloses a method for producing a spark plug including a center electrode (3) having a front end portion to which a columnar noble metal tip (12), an insulator (2) having an axial hole in an axial direction for holding the center electrode on a front end side of the axial hole, a metal shell (6) for holding the insulator while surrounding the circumference of the insulator, and a ground electrode (7) having one end portion joined to the metal shell, and the other end portion facing the center electrode, the method comprising the steps of resistance-welding (Fig. 5) a bottom surface of the noble metal tip (12) on a side opposite to a counter surface of the noble metal tip facing the ground electrode to the front end portion of the center electrode to thereby form a flange portion (14) having a swollen outer diameter of the noble metal tip in a bottom portion of the noble metal tip, and welding (17, Fig. 5) the noble metal tip to the center electrode welding in such a manner that a laser beam is applied on the whole circumference of the flange portion of the noble metal tip.

Oshima is silent in regards to the limitation of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the ground electrode from a boundary surface between the molten portion and a non-molten portion of the noble metal tip becomes 60% or higher.

However, in the same field of endeavor, Osamura discloses a method for producing a spark plug by adjusting the noble metal content within the junction layer between the electrode and the noble metal tip, wherein content of the noble metal content in a position far by about 0.05 mm inward a molten portion between the noble metal tip and the other end portion of the ground electrode from a boundary surface between the molten portion and a non-molten portion

of the noble metal tip becomes 60 % or higher (Column 13, lines 19-52), in order to suppress internal thermal stress and prevent peeling or cracking of the junction between electrode and noble tip. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the noble metal content in the junction layer disclosed by Osamura in the method of Oshima in order to suppress internal thermal stress within the junction layer and prevent peeling or cracking of the junction between electrode and noble tip.

The combined references to Oshima in view of Osamura fail to exemplify the limitation of providing a seat tip joined to a bottom surface of the noble metal tip facing the ground electrode to the front end portion of the center electrode, and having a thermal expansion coefficient between that of the noble metal tip and that the electrode.

However, in the same field of endeavor, Katoh discloses a method for producing a spark plug provided with a pre-formed composite noble metal tip (Fig. 9) comprising a noble metal tip (11C) and a seat tip (19C) joined to bottom surface of the noble metal tip, the seat tip acts as a stress relieving layer having a thermal expansion coefficient between that of the noble metal tip and that the electrode in order to reduce the thermal stress between the metal chip and the electrode main body (Column 21, lines 1-41). Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the seat tip layer disclosed by Katoh in the method of Oshima in view of Osamura in order to provide a thermal stress relieving layer to reduce the thermal stress between the metal chip and the electrode main body.

Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima (JP 07-022155 A) in view of Osamura (US 6,215,235), and further in view of Yamaguchi et al. (US 4,700,103).

Regarding claims 3 and 9, the combined references to Oshima in view of Osamura fail to exemplify the limitation of the noble metal tip is resistance-welded so that the sectional area of the flange portion in the axial direction of the noble metal tip is not smaller than 1.3 times as large as the area of the counter surface. However, in the same field of endeavor, Yamaguchi discloses a method for producing a spark plug comprising the step of resistance-welding a bottom surface of a noble metal tip to thereby form a flange portion having a swollen outer diameter of the noble tip in a bottom portion of the noble metal tip, wherein the sectional area of the flange portion (calculated from diameter B, Fig. 3) in the axial direction of the noble metal tip is not smaller than 1.3 times as large as the area of the counter surface (calculated from diameter A, Fig. 3), Yamaguchi discloses the relationship $B \geq 1.2\ A$ (Column 5, lines 55-58), thus the area of the flange potion will consequently be at least 1.2 times greater than the area of the counter surface, the disclosed arrangement provides a satisfactory welded joint strength which prevents separation of the noble tips from the electrode main body.

Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the area relationship disclosed by Yamaguchi in the method of Oshima in view of Osamura in order to provide a satisfactory welded joint strength which prevents separation of the noble tips from the electrode main body.

Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima (JP 07-022155 A) in view of Osamura (US 6,215,235), in view of Kondo et al. (US 4,540,910), and further in view of Yamaguchi et al. (US 4,700,103).

Regarding claims 8 and 10, the combined references to Oshima in view of Osamura-Kondo fail to exemplify the limitation of the noble metal tip is resistance-welded so that the sectional area of the flange portion in the axial direction of the noble metal tip is not smaller than 1.2 times as large as the area of the counter surface. However, in the same field of endeavor, Yamaguchi discloses a method for producing a spark plug comprising the step of resistance-welding a bottom surface of a noble metal tip to thereby form a flange portion having a swollen outer diameter of the noble tip in a bottom portion of the noble metal tip, wherein the sectional area of the flange portion (calculated from diameter B, Fig. 3) in the axial direction of the noble metal tip is not smaller than 1.2 times as large as the area of the counter surface (calculated from diameter A, Fig. 3), Yamaguchi discloses the relationship $B \geq 1.2\ A$ (Column 5, lines 55-58), thus the area of the flange potion will consequently be at least 1.2 times greater than the area of the counter surface, the disclosed arrangement provides a satisfactory welded joint strength which prevents separation of the noble tips from the electrode main body.

Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the area relationship disclosed by Yamaguchi in the method of Oshima in view of Osamura-Kondo in order to provide a satisfactory welded joint strength which prevents separation of the noble tips from the electrode main body.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima (JP 07-022155 A) in view of Osamura (US 6,215,235), in view of Katoh et al. (US 5,465,022), and further in view of Yamaguchi et al. (US 4,700,103).

Regarding claims 11 and 12, the combined references to Oshima in view of Osamura-Katoh fail to exemplify the limitation of the noble metal tip is resistance-welded so that the sectional area of the flange portion in the axial direction of the noble metal tip is not smaller than

1.2 times as large as the area of the counter surface. However, in the same field of endeavor, Yamaguchi discloses a method for producing a spark plug comprising the step of resistance-welding a bottom surface of a noble metal tip to thereby form a flange portion having a swollen outer diameter of the noble tip in a bottom portion of the noble metal tip, wherein the sectional area of the flange portion (calculated from diameter B, Fig. 3) in the axial direction of the noble metal tip is not smaller than 1.2 times as large as the area of the counter surface (calculated from diameter A, Fig. 3), Yamaguchi discloses the relationship B ≥ 1.2 A (Column 5, lines 55-58), thus the area of the flange potion will consequently be at least 1.2 times greater than the area of the counter surface, the disclosed arrangement provides a satisfactory welded joint strength which prevents separation of the noble tips from the electrode main body.

Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the area relationship disclosed by Yamaguchi in the method of Oshima in view of Osamura-Katoh in order to provide a satisfactory welded joint strength which prevents separation of the noble tips from the electrode main body.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mariceli Santiago whose telephone number is (571) 272-2464. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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/Mariceli Santiago/
Primary Examiner, Art Unit 2879